

WHAT IS CLAIMED IS:

1. A method of forming a semiconductor device comprising:
sequentially forming a supporting layer and a sacrificial layer over a
5 semiconductor substrate;
forming an opening by patterning the sacrificial layer and the
supporting layer;
forming a bottom electrode covering the inner wall and the bottom of
the opening;
10 removing the sacrificial layer by a wet etch process; and
forming a dielectric layer and an upper electrode on the bottom
electrode and the supporting layer,
wherein the sacrificial layer is formed of a material having a faster wet
etch rate than the supporting layer.

15 2. The method as claimed in claim 1, further comprising forming a
bottom contact plug on the semiconductor substrate before forming the
supporting layer, wherein the opening exposes the bottom contact plug and the
opening has a wider width than the bottom contact plug.

20 3. The method as claimed in claim 1, wherein the supporting layer
is formed of a plasma-enhanced tetraethyl orthosilicate (PETEOS) oxide or a
high-density plasma (HDP) oxide.

4. The method as claimed in claim 1, wherein the sacrificial layer is formed of one material selected from a group consisting of a hydrogen silsesquioxane (HSQ) oxide, a borophosphosilicate glass (BPSG) oxide and a phosphosilicate (PSG) oxide.

5. The method as claimed in claim 1, wherein the wet etch process is performed by using a HF solution.

6. The method as claimed in claim 1, further comprising:
forming a dielectric layer over an entire surface of the semiconductor substrate comprising the upper electrode;
patterning the dielectric layer to form a contact hole; and
filling the contact hole with a conductive material to form a contact plug.

7. A method of forming a semiconductor device comprising:
sequentially forming a supporting layer and a sacrificial layer over a semiconductor substrate;
forming an opening by patterning the sacrificial layer and the supporting layer; and
removing the sacrificial layer by a wet etch process, wherein the sacrificial layer is formed of a material that has a faster wet etch rate than the

supporting layer.

8. The method as claimed in claim 7, further comprising:

forming a dielectric layer over a sacrificial layer;

5 patterning the dielectric layer and the supporting layer to form a contact hole; and

filling the contact hole with a conductive material to form a contact plug.

10 9. The method as claimed in claim 7, wherein the supporting layer includes a plasma-enhanced tetraethyl orthosilicate (PETEOS) oxide or a high-density plasma (HDP) oxide.

15 10. The method as claimed in claim 7, wherein the sacrificial layer includes a hydrogen silsesquioxane (HSQ) oxide, a borophosphosilicate glass (BPSG) oxide and a phosphosilicate (PSG) oxide.

11. The method as claimed in claim 7, wherein the wet etch process is performed by using a HF solution.

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